

**Dover Municipal Landfill Superfund Site
Second Consent Decree for RD/RA**

Civil Action No. 1:92-cv-406-M

APPENDIX A-1

1991 ROD

(Part 3 of 6)

Hampshire waste survey as being produced by these industries.

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Unit not given

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Sent to Dover Wastewater Treatment Plant. Ultimate disposal of wastewater sludge was the Dover Municipal Landfill.

"..."

Waste names obtained directly from New Hampshire survey.

Unknown

Exact composition unknown. Amounts produced per year were not listed in New Hampshire survey.

TABLE 2

<u>Contaminants of Concern</u>	<u>Maximum Concentration</u> ppb (ug/L)	<u>Frequency of Detection</u>	
		RI (Wehran, 1988)	FES (HMM, 1991)
Acetone	130	6/10	3/10
Arsenic	1300	3/4	5/5
Benzene	80	6/10	6/10
Cadmium	0	ND	
Chloroethane	38	ND	2/10
1,1-Dichloroethylene	13	2/10	1/10
1,2-Dichloroethane	76.3	3/10	ND
Mercury	0	ND	1/5
Methylene Chloride	360	ND	1/10
Methyl Ethyl Ketone	230	6/10	2/10
Methyl Isobutyl Ketone	360	8/10	4/10
Tetrachloroethylene	6	1/10	1/10
Tetrahydrofuran	1707.5	9/10	NA
Toluene	470	9/10	9/10
Trichloroethylene	11	1/10	1/10
Vinyl Chloride	62	1/10	3/10

The table lists the maximum value of contamination found in selected monitoring wells during the FES activities except for two compounds. Data from the RI was used for tetrahydrofuran which was not analyzed for in the FES and 1,2-dichloroethane which was not detected in the FES.

TABLE -3
RISK ESTIMATES FOR USE OF GROUNDWATER
IN THE AREA OF FUTURE DEVELOPMENT

Groundwater - future Development
Ingestion of Drinking water, Most-Probable Case

Compound	CONC MED ppm	2 LIT/ DAY	BODY WT kg	EXP CALC mg/kg/day	RfD VALUES mg/kg/day	CARCIN POTENCY (mg/kg/day) ⁻¹	RfD CALC	CARCIN CALC
Acetone	0.0235	2	70	6.71E-04	1.00E-01	NA	0.007	0.00E+00
Arsenic	0.3535	2	70	1.01E-02	1.00E-03	1.75E+00	10.100	1.77E-02
Benzene	0.0233	2	70	6.66E-04	NA	2.90E-02	0.000	1.93E-05
Cadmium	0	2	70	0.00E+00	5.00E-04	NA	0.000	0.00E+00
Chloroethane	0.006	2	70	1.71E-04	NA	1.30E-02	0.000	2.23E-06
1,1-Dichloroethylene	0.0013	2	70	3.71E-05	9.00E-03	6.00E-01	0.004	2.23E-05
1,2-Dichloroethane	0.0157	2	70	4.49E-04	NA	9.10E-02	0.000	4.08E-05
Mercury	0	2	70	0.00E+00	1.40E-03	NA	0.000	0.00E+00
Methylene Chloride	0.036	2	70	1.03E-03	6.00E-02	7.50E-03	0.017	7.71E-06
Methyl Ethyl Ketone	0.035	2	70	1.00E-03	5.00E-02	NA	0.020	0.00E+00
Methyl Isobutyl Ketone	0.0698	2	70	1.99E-03	5.00E-02	NA	0.040	0.00E+00
Tetrachloroethylene	0.0006	2	70	1.71E-05	1.00E-02	5.10E-02	0.002	8.74E-07
Tetrahydrofuran	0.429	2	70	1.23E-02	2.00E-03	NA	6.129	0.00E+00
Toluene	0.1094	2	70	3.13E-03	3.00E-01	NA	0.010	0.00E+00
Trichloroethylene	0.0011	2	70	3.14E-05	NA	1.10E-02	0.000	3.46E-07
Vinyl chloride	0.0131	2	70	3.74E-04	NA	2.30E+00	0.000	8.61E-04
Revised Risk							16.33	1.86E-02

Groundwater - Future Development
Ingestion of Drinking Water, Worst-Case

Compound	CONC MED ppm	2 LIT/ DAY	BODY WT kg	EXP CALC mg/kg/day	RfD VALUES mg/kg/day	CARCIN POTENCY (mg/kg/day) ⁻¹	RfD CALC	CARCIN CALC
Acetone	0.13	2	70	3.71E-03	1.00E-01	NA	0.037	0.00E+00
Arsenic	1.3	2	70	3.71E-02	1.00E-03	1.75E+00	37.143	6.50E-02
Benzene	0.08	2	70	2.29E-03	NA	2.90E-02	0.000	6.63E-05
Cadmium	0	2	70	0.00E+00	5.00E-04	NA	0.000	0.00E+00
Chloroethane	0.038	2	70	1.09E-03	NA	1.30E-02	0.000	1.41E-05
1,1-Dichloroethylene	0.013	2	70	3.71E-04	9.00E-03	6.00E-01	0.041	2.23E-04
1,2-Dichloroethane	0.0763	2	70	2.18E-03	NA	9.10E-02	0.000	1.98E-04
Mercury	0	2	70	0.00E+00	1.40E-03	NA	0.000	0.00E+00
Methylene Chloride	0.36	2	70	1.03E-02	6.00E-02	7.50E-03	0.171	7.71E-05
Methyl Ethyl Ketone	0.23	2	70	6.57E-03	5.00E-02	NA	0.131	0.00E+00
Methyl Isobutyl Ketone	0.36	2	70	1.03E-02	5.00E-02	NA	0.206	0.00E+00
Tetrachloroethylene	0.006	2	70	1.71E-04	1.00E-02	5.10E-02	0.017	8.74E-06
Tetrahydrofuran	1.7075	2	70	4.88E-02	2.00E-03	NA	24.393	0.00E+00
Toluene	0.47	2	70	1.34E-02	3.00E-01	NA	0.045	0.00E+00
Trichloroethylene	0.011	2	70	3.14E-04	NA	1.10E-02	0.000	3.46E-06
Vinyl chloride	0.062	2	70	1.77E-03	NA	2.30E+00	0.000	4.07E-03
Revised Risk							62.18	6.97E-02

NOTES:

Most-Probable Case utilizes the average contaminant concentration from all wells exhibiting VOC contamination in the FES.

Worst-Case utilizes the maximum contaminant concentration detected from wells exhibiting VOC contamination in the FES.

Exp Calc = Average Daily Dose of contaminant

RfD Value = Reference Dose for particular contaminant

Carcin Potency = Carcinogenic Potency of the particular contaminant, now known as the slope factor

RfD Calc = Non-Carcinogenic Risk Estimate

Carcin Calc = Carcinogenic Risk Estimate

NA = Not Available

TABLE 4
RISK ESTIMATES FOR FUTURE USE OF
BELLAMY RESERVOIR

Surface Water - Bellamy Reservoir
Ingestion of Drinking Water
Most-Probable and Worst-Case

Compound	CONC MED ppm	2 LIT/ DAY	BODY WT kg	EXP CALC mg/kg/day	RfD VALUES mg/kg/day	CARCIN POTENCY (mg/kg/day) ⁻¹	RfD CALC	CARCIN CALC
Acetone	1.07E-04	2	70	3.06E-06	1.00E-01	NA	3.06E-05	0.00E+00
Arsenic	1.52E-04	2	70	4.34E-06	1.00E-03	1.75E+00	4.34E-03	7.60E-06
Benzene	8.90E-05	2	70	2.54E-06	NA	2.90E-02	0.00E+00	7.37E-08
Cadmium	0.00E+00	2	70	0.00E+00	5.00E-04	NA	0.00E+00	0.00E+00
Chloroethane	6.46E-05	2	70	1.85E-06	NA	1.50E-02	0.00E+00	2.40E-08
1,1-Dichloroethylene	0.00E+00	2	70	0.00E+00	9.00E-03	6.00E-01	0.00E+00	0.00E+00
1,2-Dichloroethane	8.60E-05	2	70	2.46E-06	NA	9.10E-02	0.00E+00	2.24E-07
Mercury	1.10E-06	2	70	3.16E-08	1.40E-03	NA	2.24E-05	0.00E+00
Methylene Chloride	0.00E+00	2	70	0.00E+00	6.00E-02	7.50E-03	0.00E+00	0.00E+00
Methyl Ethyl Ketone	1.60E-04	2	70	4.57E-06	5.00E-02	NA	9.14E-05	0.00E+00
Methyl Isobutyl Ketone	1.80E-03	2	70	5.14E-05	5.00E-02	NA	1.03E-03	0.00E+00
Tetrachloroethylene	0.00E+00	2	70	0.00E+00	1.00E-02	5.10E-02	0.00E+00	0.00E+00
Tetrahydrofuran	2.94E-03	2	70	8.40E-05	2.00E-03	NA	4.20E-02	0.00E+00
Toluene	3.56E-03	2	70	1.02E-04	3.00E-01	NA	3.39E-04	0.00E+00
1,1-Dichloroethylene	0.00E+00	2	70	0.00E+00	NA	1.10E-02	0.00E+00	0.00E+00
Vinyl chloride	0.00E+00	2	70	0.00E+00	NA	2.30E+00	0.00E+00	0.00E+00
Revised Risk							4.79E-02	7.92E-06

NOTES:

Most-Probable Case and Worst-Case utilize the same contaminant concentration.

Exp Calc = Average Daily Dose of contaminant

RfD Value = Reference Dose for particular contaminant

Carcin Potency = Carcinogenic Potency of the particular contaminant, now known as the slope factor

RfD Calc = Non-Carcinogenic Risk Estimate

Carcin Calc = Carcinogenic Risk Estimate

NA = Not Available

TABLE -5
RISK ESTIMATES FOR INGESTION OF
SURFACE WATER - COCHECO RIVER

Surface Water - Cochecho River
Ingestion of Surface Water, Most Probable Case

Compound	CONC MED ppm	WATER INGEST L/event	# EVENT/ YEAR	TKF	365 DAYS YEAR	BODY WT kg	EXPOS DAY mg/kg/day	EXPOSE LIFE mg/kg/day	RfD VALUES mg/kg/day	CARCIN POTENCY (mg/kg/day) ⁻¹	RfD CALC	CARCIN CALC
Acetone	5.99E-05	0.05	12	1	365	40	2.46E-09	3.51E-10	1.00E-01	NA	2.46E-08	0.00E+00
Arsenic	6.00E-05	0.05	12	1	365	40	2.47E-09	3.52E-10	1.00E-03	1.75E+00	2.47E-06	6.16E-10
Benzene	3.50E-05	0.05	12	1	365	40	1.44E-09	2.05E-10	NA	2.90E-02	0.00E+00	5.96E-12
Cadmium	0	0.05	12	1	365	40	0.00E+00	0.00E+00	5.00E-04	NA	0.00E+00	0.00E+00
Chloroethane	3.61E-05	0.05	12	1	365	40	1.48E-09	2.12E-10	NA	1.30E-02	0.00E+00	2.76E-12
1,1-Dichloroethylene	0	0.05	12	1	365	40	0.00E+00	0.00E+00	9.00E-03	6.00E-01	0.00E+00	0.00E+00
1,2-Dichloroethane	4.80E-05	0.05	12	1	365	40	1.97E-09	2.82E-10	NA	9.10E-02	0.00E+00	2.56E-11
Mercury	4.00E-07	0.05	12	1	365	40	1.64E-11	2.35E-12	1.40E-03	NA	1.17E-08	0.00E+00
Methylene Chloride	0	0.05	12	1	365	40	0.00E+00	0.00E+00	6.00E-02	7.50E-03	0.00E+00	0.00E+00
Methyl Ethyl Ketone	9.00E-05	0.05	12	1	365	40	3.70E-09	5.28E-10	5.00E-02	NA	7.40E-08	0.00E+00
Methyl Isobutyl Keton	1.01E-03	0.05	12	1	365	40	4.15E-08	5.93E-09	5.00E-02	NA	8.30E-07	0.00E+00
Tetrachloroethylene	0	0.05	12	1	365	40	0.00E+00	0.00E+00	1.00E-02	5.10E-02	0.00E+00	0.00E+00
Tetrahydrofuran	1.64E-03	0.05	12	1	365	40	6.74E-08	9.63E-09	2.00E-03	NA	3.37E-05	0.00E+00
Toluene	1.40E-03	0.05	12	1	365	40	5.75E-08	8.22E-09	3.00E-01	NA	1.92E-07	0.00E+00
Trichloroethylene	0	0.05	12	1	365	40	0.00E+00	0.00E+00	NA	1.10E-02	0.00E+00	0.00E+00
Vinyl chloride	0	0.05	12	1	365	40	0.00E+00	0.00E+00	NA	2.30E+00	0.00E+00	0.00E+00
Revised Risk											3.73E-05	6.51E-10

Surface Water - Cochecho River
Ingestion of Surface Water, Worst-Case

Compound	CONC MED ppm	WATER INGEST L/event	# EVENT/ YEAR	TKF	365 DAYS YEAR	BODY WT kg	EXPOS DAY mg/kg/day	EXPOSE LIFE mg/kg/day	RfD VALUES mg/kg/day	CARCIN POTENCY (mg/kg/day) ⁻¹	RfD CALC	CARCIN CALC
Acetone	5.99E-05	0.1	24	1	365	40	9.84E-09	1.41E-09	1.00E-01	NA	9.84E-08	0.00E+00
Arsenic	6.00E-05	0.1	24	1	365	40	9.86E-09	1.41E-09	1.00E-03	1.75E+00	9.86E-06	2.47E-09
Benzene	3.50E-05	0.1	24	1	365	40	5.75E-09	8.22E-10	NA	2.90E-02	0.00E+00	2.38E-11
Cadmium	0	0.1	24	1	365	40	0.00E+00	0.00E+00	5.00E-04	NA	0.00E+00	0.00E+00
Chloroethane	3.61E-05	0.1	24	1	365	40	5.93E-09	8.48E-10	NA	1.30E-02	0.00E+00	1.10E-11
1,1-Dichloroethylene	0	0.1	24	1	365	40	0.00E+00	0.00E+00	9.00E-03	6.00E-01	0.00E+00	0.00E+00
1,2-Dichloroethane	4.80E-05	0.1	24	1	365	40	7.89E-09	1.13E-09	NA	9.10E-02	0.00E+00	1.03E-12
Mercury	4.00E-07	0.1	24	1	365	40	6.58E-11	9.39E-12	1.40E-03	NA	4.70E-08	0.00E+00
Methylene Chloride	0	0.1	24	1	365	40	0.00E+00	0.00E+00	6.00E-02	7.50E-03	0.00E+00	0.00E+00
Methyl Ethyl Ketone	9.00E-05	0.1	24	1	365	40	1.48E-08	2.11E-09	5.00E-02	NA	2.96E-07	0.00E+00
Methyl Isobutyl Keton	1.01E-03	0.1	24	1	365	40	1.66E-07	2.37E-08	5.00E-02	NA	3.32E-06	0.00E+00
Tetrachloroethylene	0	0.1	24	1	365	40	0.00E+00	0.00E+00	1.00E-02	5.10E-02	0.00E+00	0.00E+00
Tetrahydrofuran	1.64E-03	0.1	24	1	365	40	2.70E-07	3.85E-08	2.00E-03	NA	1.35E-04	0.00E+00
Toluene	1.40E-03	0.1	24	1	365	40	2.30E-07	3.29E-08	3.00E-01	NA	7.67E-07	0.00E+00
Trichloroethylene	0	0.1	24	1	365	40	0.00E+00	0.00E+00	NA	1.10E-02	0.00E+00	0.00E+00
Vinyl chloride	0	0.1	24	1	365	40	0.00E+00	0.00E+00	NA	2.30E+00	0.00E+00	0.00E+00
Revised Risk											1.49E-04	2.60E-09

TABLE -6
RISK ESTIMATES FOR DERMAL CONTACT WITH
SURFACE WATER - COCHECO RIVER

Surface Water - Cochemo River

Dermal Contact with Surface Water, Most Probable Case

Compounds	CONC MED ppm	TL/ 1000 cm ³	SKIN AREA cm ²	HRS/ EVNT	PERM CONS cm/hr	# EVNT YR	365 DAYS YEAR	BDY WT kg	EXPOS DAY mg/kg/day	EXPOSE LIFE mg/kg/day	RfD VALUES mg/kg/day	CARC POTEN mg/kg/day-1	RfD CALC	CARCIN CALC
Acetone	5.99E-05	0.001	10000	1	8E-04	12	365	40	3.94E-10	5.62E-11	1.00E-01	NA	3.94E-09	0.00E-0C
Arsenic	6.00E-05	0.001	10000	1	8E-04	12	365	40	3.95E-10	5.64E-11	1.00E-03	1.75E+00	3.95E-07	9.86E-11
Benzene	3.50E-05	0.001	10000	1	0.041	12	365	40	1.18E-08	1.68E-09	NA	2.90E-02	0.00E+00	4.89E-11
Cadmium	0	0.001	10000	1	8E-04	12	365	40	0.00E+00	0.00E+00	5.00E-04	NA	0.00E+00	0.00E+00
Chloroethane	3.61E-05	0.001	10000	1	8E-04	12	365	40	2.37E-10	3.39E-11	NA	1.30E-02	0.00E+00	4.41E-13
1,1-Dichloroethyle	0	0.001	10000	1	8E-04	12	365	40	0.00E+00	0.00E+00	9.00E-03	6.00E-01	0.00E+00	0.00E+0C
1,2-Dichloroethane	4.80E-05	0.001	10000	1	8E-04	12	365	40	3.16E-10	4.31E-11	NA	9.10E-02	0.00E+00	4.10E-12
Mercury	4.00E-07	0.001	10000	1	8E-04	12	365	40	2.63E-12	3.76E-13	1.40E-03	NA	1.88E-09	0.00E+00
Methylene Chloride	0	0.001	10000	1	8E-04	12	365	40	0.00E+00	0.00E+00	6.00E-02	7.50E-03	0.00E+00	0.00E+00
Methyl Ethyl Keton	9.00E-05	0.001	10000	1	8E-04	12	365	40	5.92E-10	8.45E-11	5.00E-02	NA	1.18E-08	0.00E+00
Methyl Isobutyl Ke	1.01E-03	0.001	10000	1	8E-04	12	365	40	6.64E-09	9.49E-10	5.00E-02	NA	1.33E-07	0.00E+00
Tetrachloroethylen	0	0.001	10000	1	8E-04	12	365	40	0.00E+00	0.00E+00	1.00E-02	5.10E-02	0.00E+00	0.00E+00
Tetrahydrofuran	1.64E-03	0.001	10000	1	8E-04	12	365	40	1.08E-08	1.54E-09	2.00E-03	NA	5.39E-06	0.00E+00
Toluene	1.40E-03	0.001	10000	1	9E-04	12	365	40	1.04E-08	1.48E-09	3.00E-01	NA	3.45E-08	0.00E+00
Trichloroethylene	0	0.001	10000	1	8E-04	12	365	40	0.00E+00	0.00E+00	NA	1.10E-02	0.00E+00	0.00E+0C
Vinyl chloride	0	0.001	10000	1	8E-04	12	365	40	0.00E+00	0.00E+00	NA	2.30E+00	0.00E+00	0.00E+0C
Revised Risk													5.97E-06	1.52E-1C

Surface Water - Cochemo River

Dermal Contact with Surface Water, Worst-Case

Compounds	CONC MED ppm	TL/ 1000 cm ³	SKIN AREA cm ²	HRS/ EVNT	PERM CONS cm/hr	# EVNT YR	365 DAYS YEAR	BDY WT kg	EXPOS DAY mg/kg/day	EXPOSE LIFE mg/kg/day	RfD VALUES mg/kg/day	CARC POTEN mg/kg/day-1	RfD CALC	CARCIN CALC
Acetone	5.99E-05	0.001	10000	2	8E-04	24	365	40	1.57E-09	2.25E-10	1.00E-01	NA	1.57E-08	0.00E+0C
Arsenic	6.00E-05	0.001	10000	2	8E-04	24	365	40	1.58E-09	2.25E-10	1.00E-03	1.75E+00	1.58E-06	3.95E-1C
Benzene	3.50E-05	0.001	10000	2	0.041	24	365	40	4.72E-08	6.74E-09	NA	2.90E-02	0.00E+00	1.95E-1C
Cadmium	0	0.001	10000	2	8E-04	24	365	40	0.00E+00	0.00E+00	5.00E-04	NA	0.00E+00	0.00E+0C
Chloroethane	3.61E-05	0.001	10000	2	8E-04	24	365	40	9.49E-10	1.36E-10	NA	1.30E-02	0.00E+00	1.76E-12
1,1-Dichloroethyle	0	0.001	10000	2	8E-04	24	365	40	0.00E+00	0.00E+00	9.00E-03	6.00E-01	0.00E+00	0.00E+00
1,2-Dichloroethane	4.80E-05	0.001	10000	2	8E-04	24	365	40	1.26E-09	1.80E-10	NA	9.10E-02	0.00E+00	1.64E-11
Mercury	4.00E-07	0.001	10000	2	8E-04	24	365	40	1.05E-11	1.50E-12	1.40E-03	NA	7.51E-09	0.00E+00
Methylene Chloride	0	0.001	10000	2	8E-04	24	365	40	0.00E+00	0.00E+00	6.00E-02	7.50E-03	0.00E+00	0.00E+00
Methyl Ethyl Keton	9.00E-05	0.001	10000	2	8E-04	24	365	40	2.37E-09	3.38E-10	5.00E-02	NA	4.73E-08	0.00E+00
Methyl Isob. Ket.	1.01E-03	0.001	10000	2	8E-04	24	365	40	2.66E-08	3.79E-09	5.00E-02	NA	5.31E-07	0.00E+00
Tetrachloroethylen	0	0.001	10000	2	8E-04	24	365	40	0.00E+00	0.00E+00	1.00E-02	5.10E-02	0.00E+00	0.00E+0C
Tetrahydrofuran	1.64E-03	0.001	10000	2	8E-04	24	365	40	4.31E-08	6.16E-09	2.00E-03	NA	2.16E-05	0.00E+0C
Toluene	1.40E-03	0.001	10000	2	9E-04	24	365	40	4.14E-08	5.92E-09	3.00E-01	NA	1.38E-07	0.00E+0C
Trichloroethylene	0	0.001	10000	2	8E-04	24	365	40	0.00E+00	0.00E+00	NA	1.10E-02	0.00E+00	0.00E+0C
Vinyl chloride	0	0.001	10000	2	8E-04	24	365	40	0.00E+00	0.00E+00	NA	2.30E+00	0.00E+00	0.00E+0C
Revised Risk													2.39E-05	6.08E-1C

TABLE -7
RISK ESTIMATES FOR DERMAL CONTACT WITH
SURFACE WATER - SWALE

Surface Water - Swale
 Dermal Contact, Most Probable Case

Compounds	CONC -MED ppm	1L/ 1000 cm ³	SKIN AREA cm ²	HR/ EVT	PERM CONS cm/hr	# EVNT YR	365 DAYS YEAR	BDY WT kg	EXPOS DAY mg/kg/day	EXPOSE LIFE mg/kg/day	RfD VALUES mg/kg/day	CARC POTEN mg/kg/day-1	RfD CALC	CARCIN CALC
Acetone	0.0026	0.001	1800	1	8E-04	12	365	40	3.08E-09	4.40E-10	1.00E-01	NA	3.08E-08	0.00E+00
Arsenic	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	1.00E-03	1.75E+00	0.00E+00	0.00E+00
Benzene	0.0042	0.001	1800	1	0.041	12	365	40	2.55E-07	3.64E-08	NA	2.90E-02	0.00E+00	1.06E-09
Cadmium	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	5.00E-04	NA	0.00E+00	0.00E+00
Chloroethane	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	NA	1.30E-02	0.00E+00	0.00E+00
1,1-Dichloroethylene	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	9.00E-03	6.00E-01	0.00E+00	0.00E+00
1,2-Dichloroethane	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	NA	9.10E-02	0.00E+00	0.00E+00
Mercury	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	1.40E-03	NA	0.00E+00	0.00E+00
Methylene Chloride	0.0031	0.001	1800	1	8E-04	12	365	40	3.67E-09	5.24E-10	6.00E-02	7.50E-03	6.12E-08	3.93E-12
Methyl Ethyl Keton	0.169	0.001	1800	1	8E-04	12	365	40	2.00E-07	2.86E-08	5.00E-02	NA	4.00E-06	0.00E+00
Methyl Iso. Ket.	0.0556	0.001	1800	1	8E-04	12	365	40	6.58E-08	9.40E-09	5.00E-02	NA	1.32E-06	0.00E+00
Tetrachloroethylen	0.001	0.001	1800	1	8E-04	12	365	40	1.18E-09	1.69E-10	1.00E-02	5.10E-02	1.18E-07	8.62E-12
Tetrahydrofuran	0.0273	0.001	1800	1	8E-04	12	365	40	3.23E-08	4.62E-09	2.00E-03	NA	1.62E-05	0.00E+00
Toluene	0.0314	0.001	1800	1	9E-04	12	365	40	4.18E-08	5.97E-09	3.00E-01	NA	1.39E-07	0.00E+00
Trichloroethylene	0.0065	0.001	1800	1	8E-04	12	365	40	7.69E-09	1.10E-09	NA	1.10E-02	0.00E+00	1.21E-11
Vinyl chloride	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	NA	2.30E+00	0.00E+00	0.00E+00
Revised Risk													2.18E-05	1.08E-09

Surface Water - Swale
 Dermal Contact, Worst-Case

Compounds	CONC -MED ppm	1L/ 1000 cm ³	SKIN AREA cm ²	HR/ EVT	PERM CONS cm/hr	# EVNT YR	365 DAYS YEAR	BDY WT kg	EXPOS DAY mg/kg/day	EXPOSE LIFE mg/kg/day	RfD VALUES mg/kg/day	CARC POTEN mg/kg/day-1	RfD CALC	CARCIN CALC
Acetone	0.028	0.001	1800	1	8E-04	12	365	40	3.31E-08	4.73E-09	1.00E-01	NA	3.31E-07	0.00E+00
Arsenic	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	1.00E-03	1.75E+00	0.00E+00	0.00E+00
Benzene	0.013	0.001	1800	1	0.041	12	365	40	7.89E-07	1.13E-07	NA	2.90E-02	0.00E+00	3.27E-09
Cadmium	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	5.00E-04	NA	0.00E+00	0.00E+00
Chloroethane	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	NA	1.30E-02	0.00E+00	0.00E+00
1,1-Dichloroethylene	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	9.00E-03	6.00E-01	0.00E+00	0.00E+00
1,2-Dichloroethane	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	NA	9.10E-02	0.00E+00	0.00E+00
Mercury	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	1.40E-03	NA	0.00E+00	0.00E+00
Methylene Chloride	0.025	0.001	1800	1	8E-04	12	365	40	2.96E-08	4.23E-09	6.00E-02	7.50E-03	4.93E-07	3.17E-11
Methyl Ethyl Keton	0.784	0.001	1800	1	8E-04	12	365	40	9.28E-07	1.33E-07	5.00E-02	NA	1.86E-05	0.00E+00
Methyl Iso. Ket.	0.2138	0.001	1800	1	8E-04	12	365	40	2.53E-07	3.61E-08	5.00E-02	NA	5.06E-06	0.00E+00
Tetrachloroethylen	0.011	0.001	1800	1	8E-04	12	365	40	1.30E-08	1.86E-09	1.00E-02	5.10E-02	1.30E-06	9.49E-11
Tetrahydrofuran	0.074	0.001	1800	1	8E-04	12	365	40	8.76E-08	1.25E-08	2.00E-03	NA	4.38E-05	0.00E+00
Toluene	0.152	0.001	1800	1	9E-04	12	365	40	2.02E-07	2.89E-08	3.00E-01	NA	6.75E-07	0.00E+00
Trichloroethylene	0.0389	0.001	1800	1	8E-04	12	365	40	4.60E-08	6.58E-09	NA	1.10E-02	0.00E+00	7.23E-11
Vinyl chloride	0	0.001	1800	1	8E-04	12	365	40	0.00E+00	0.00E+00	NA	2.30E+00	0.00E+00	0.00E+00
Revised Risk													7.02E-05	3.47E-09

TABLE -8
RISK ESTIMATES FOR INGESTION AND DERMAL CONTACT
WITH SEDIMENTS - SWALE

Sediment - Swale
 Soil Ingestion and Dermal Contact, Most-Probable Case

Compounds	CONC MED ppm	SOIL INGEST mg/event	SKIN AREA cm2/event	EXP events/ year	SOIL CONT mg/cm2	TKF-DA 10%	TKF-DA 100%	1.00E+06 mg/kg	BOY WT kg	365 DAYS YEAR	INGEST CALC mg/kg/day	DERMAL CALC mg/kg/day	LIFE INGEST mg/kg/day	LIFE DERMAL mg/kg/day	RfD VALUES mg/kg/day	CARCIN POTEN mg/kg/day-1
Acetone	0	50	1000	30	0.51	0.25	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	1.00E-01	NA
Arsenic	79.5	50	1000	30	0.51	0.01	0.5	1.00E+06	40	365	4.00E-06	8.33E-07	5.83E-07	1.19E-07	1.00E-03	1.75E+00
Benzene	0	50	1000	30	0.51	0.25	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	NA	2.90E-02
Cadmium	7.6	50	1000	30	0.51	0.17	1	1.00E+06	40	365	7.81E-07	1.35E-06	1.12E-07	1.934E-07	5.00E-04	NA
Chloroethane	0	50	1000	30	0.51	0.25	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	NA	1.30E-02
1,1-Dichloroethylene	0	50	1000	30	0.51	0.25	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	9.00E-03	6.00E-01
1,2-Dichloroethane	0	50	1000	30	0.51	0.25	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	NA	9.10E-02
Mercury	0.01	50	1000	30	0.51	0.1	1	1.00E+06	40	365	1.03E-09	1.05E-09	1.47E-10	1.497E-10	1.40E-03	NA
Methylene Chloride	0	50	1000	30	0.51	0.25	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	6.00E-02	7.50E-03
Methyl Ethyl Ketone	0.283	50	1000	30	0.51	0.25	1	1.00E+06	40	365	2.91E-08	7.41E-08	4.15E-09	1.059E-08	5.00E-02	NA
Methyl Isobutyl Ketone	0	50	1000	30	0.51	0.25	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	5.00E-02	NA
Tetrachloroethylene	0	50	1000	30	0.51	0.1	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	1.00E-02	5.10E-02
Tetrahydrofuran	0	50	1000	30	0.51	0.1	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	2.00E-03	NA
Toluene	0	50	1000	30	0.51	0.25	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	3.00E-01	NA
Trichloroethylene	0	50	1000	30	0.51	0.25	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	NA	1.10E-02
Vinyl chloride	0	50	1000	30	0.51	0.25	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	NA	2.30E+00

Compounds	INGEST RfD CALC	INGEST CAR CAL	DERMAL RfD CALC	DERMAL CAR CAL
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	4.00E-03	1.02E-06	8.33E-04	2.08E-07
Benzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	1.36E-03	0.00E+00	2.71E-03	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7.34E-07	0.00E+00	7.49E-07	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone	5.82E-07	0.00E+00	1.48E-06	0.00E+00
Methyl Isobutyl Ketone	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrahydrofuran	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Revised Risk	5.65E-03	1.02E-06	3.54E-03	2.08E-07
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TABLE -8 (Cont'd)
RISK ESTIMATES FOR INGESTION AND DERMAL CONTACT
WITH SEDIMENTS - SWALE

Sediment - Swale
 Soil Ingestion and Dermal Contact, Worst-Case

Compounds	CONC MED ppm	SOIL INGEST mg/event	SKIN AREA cm2/event	EXP events/ year	SOIL CONT mg/cm2	TKF-DA 10%	TKF-DA 100%	1.00E+06 mg/kg	BDY WT kg	365 DAYS YEAR	INGEST CALC mg/kg/day	DERMAL CALC mg/kg/day	LIFE INGEST mg/kg/day	LIFE DERMAL mg/kg/day	RfD mg/kg/day	CARCIN POTEN mg/kg/day-1	
Acetone	0	250	4000	90	1.5	0.5	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	1.00E-01	NA	
Arsenic	210	160	250	4000	90	0.51	0.05	1	1.00E+06	40	365	2.16E-04	8.80E-05	3.00E-05	1.25E-05	1.00E-03	1.75E+00
Benzene	0	250	4000	90	0.51	0.5	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	NA	2.90E-02	
Cadmium	12	250	4000	90	0.51	0.8	1	1.00E+06	40	365	1.85E-05	1.21E-04	2.64E-06	1.725E-05	5.00E-04	NA	
Chloroethane	0	250	4000	90	0.51	0.5	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	NA	1.30E-02	
1,1-Dichloroethylene	0	250	4000	90	0.51	0.5	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	9.00E-03	6.00E-01	
1,2-Dichloroethane	0	250	4000	90	0.51	0.5	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	NA	9.10E-02	
Mercury	0.02	250	4000	90	0.51	0.5	1	1.00E+06	40	365	3.00E-02	1.26E-07	4.40E-09	1.796E-08	1.40E-03	NA	
Methylene Chloride	0	250	4000	90	0.51	0.5	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	6.00E-02	7.50E-03	
Methyl Ethyl Ketone	1.7	250	4000	90	0.51	0.5	1	1.00E+06	40	365	2.62E-06	1.07E-05	3.74E-07	1.527E-06	5.00E-02	NA	
Methyl Isobutyl Keton	0	250	4000	90	0.51	0.5	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	5.00E-02	NA	
Tetrachloroethylene	0	250	4000	90	0.51	0.5	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	1.00E-02	5.10E-02	
Tetrahydrofuran	0	250	4000	90	0.51	0.5	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	2.00E-03	NA	
Toluene	0	250	4000	90	0.51	0.5	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	3.00E-01	NA	
Trichloroethylene	0	250	4000	90	0.51	0.5	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	NA	1.10E-02	
Vinyl chloride	0	250	4000	90	0.51	0.5	1	1.00E+06	40	365	0.00E+00	0.00E+00	0	0	NA	2.30E+00	

Compounds	INGEST RfD CALC	INGEST CAR CAL	DERMAL RfD CALC	DERMAL CAR CAL
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	2.16E-01	5.39E-05	8.80E-02	2.20E-05
Benzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	3.70E-02	0.00E+00	2.41E-01	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	2.20E-05	0.00E+00	8.98E-05	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone	5.24E-05	0.00E+00	2.14E-04	0.00E+00
Methyl Isobutyl Keton	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrahydrofuran	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Revised Risk	2.53E-01	5.39E-05	3.30E-01	2.20E-05

TABLE 9
CURRENT PROPOSED (DRAFT) INDUSTRIAL DISCHARGE
PRETREATMENT REQUIREMENTS FOR THE DOVER WASTEWATER
TREATMENT FACILITY¹

<u>Parameter (Units)</u>	<u>Discharge Limit - Industrial Discharge</u>
<u>Physical Parameters</u>	
Flow	Determined on a case-by-case basis, and contingent upon sewer line capacity
pH	6.5 - 11.0
Temperature (°F/°C)	150/65
Color	No deeply staining dyes
<u>Chemical Parameters</u>	
Total Solids (mg/l) - Avg./Max.	1,200/3,000
Total Volatile Solids (% of total)	—
Total Suspended Solids (mg/l) - Avg./Max.	400/847
Total Dissolved Solids (mg/l) - Avg./Max.	600/1,500
Settable Solids (mg/l)	30
Acidity	—
Alkalinity (mg/l as CaCO ₃)	75
5-Day BOD (mg/l)	300 (BOD - 791 mg/l)
COD	—
Oil and Grease (mg/l)	100
Petroleum Solids in Wastewater (mg/l)	25
Chloride as Cl (mg/l)	500
Sulfate as SO ₄ (mg/l)	250
Sulfites (mg/l)	2.0
Sulfide as S (mg/l)	0.1
Arsenic (mg/l)	.400
Beryllium (mg/l)	2.0
Boron (mg/l)	0.1
Cadmium (mg/l)	0.020
Chromium (Total) (mg/l)	4.03
Chromium (Hexavalent) (mg/l)	1.75
Copper (mg/l)	0.2
Lead (mg/l)	.606
Mercury (mg/l)	0.004
Nickel (mg/l)	1.07
Selenium (mg/l)	8.55
Silver (mg/l)	.713
Chlorides (mg/l)	500
Cyanides (mg/l)	.363
Phenols (mg/l)	182
Total Toxic Organics (mg/l)	5.0
Zinc (mg/l)	4.33

1. Proposed Pretreatment Standards are draft as of April, 1990, (updated based on new operating permits as of November, 1991).

APPENDIX C



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 OFFICE OF RESEARCH AND DEVELOPMENT
 ENVIRONMENTAL CRITERIA AND ASSESSMENT OFFICE
 CINCINNATI, OHIO 45268

May 3, 1990

SUBJECT: Provisional RfD for Tetrahydrofuran (THF)

FROM: Pei-Fung Hurst
 Biologist
 Chemical Mixtures Assessment Branch

TO: Rodger Duart
 U.S. EPA
 Region I

THRU: W. Bruce Peirano
 Acting Chief
 Chemical Mixture Assessment Branch

This memo is a draft response to your request for an oral assessment of the toxicity of tetrahydrofuran (THF) for the Mottolo NPL site. Although an oral RfD for THF was prepared and presented to the RfD Work Group on 01/28/87, it was not verified and was placed under review until a complete translation of the critical study (Katahira, 1982), published in Japanese, could be obtained. (An inhalation RfD for THF, based upon this same study, has been verified on 1/19/90.) Consequentially, ECAO has obtained a full translation of the Katahira (1982) study and based an interim oral RfD for THF of 0.002 mg/kg/day upon this data. Below is a summary of the Katahira (1982) study and oral RfD computations.

Male SD rats (11-12/group) were exposed to 0, 100, 200, 1000 or 5000 ppm (0, 295, 590, 2449, or 14,744 mg/m³) 4 hr/day, 5 day/week for 12 weeks. Rats exposed to 100 or 200 ppm had no effects other than redness about the eyes and nose. Increased levels of SGOT, indicative of liver damage, were observed in the rats exposed to 1000 ppm. Rats exposed to 5000 ppm had marked local irritation (edema or opacity of the cornea, salivation, discharge or bleeding from the nose), morphologically defined damage to the respiratory mucosa, significant alterations in blood counts and blood sugar, increased levels of SGOT, SGPT, and bilirubin and CNS effects (clonic muscle spasms, coma, cataleptoid posture). The rise in SGOT levels was dose related. Although a statistically significant increase in SGOT levels in rats exposed to 200 ppm is indicated in a table presented in the publication, the author only notes that increased serum enzyme changes were

observed in the two highest exposure levels. There were no changes in relative or absolute organ weights and no histopathological alterations in the brain, lungs, liver, spleen, kidneys or femur were detected in the exposed animals. Thus, the NOAEL for liver effects is 200 ppm, which is equivalent to an oral dose of 22 mg/kg/day. Application of an uncertainty factor of 10,000 (10 for use of a subchronic study; 10 for interspecies extrapolation. 10 for intraspecies variability, and 10 to account for the limited database) to the NOAEL yields an oral RfD of 0.002 mg/kg/day.

Conversion factors: 4 hr/24 hr, 5 day/7 day, 0.223 mg/m^3 rat inhalation rate, 0.35 kg rat body weight, 0.5 absorption factor (i.e. $590 \text{ mg/m}^3 \times 4 \text{ hr/24 hr} \times 5 \text{ day/7 day} \times 0.223 \text{ m}^3/\text{day} \times 1/0.35 \text{ kg} \times 0.5 = 22.4 \text{ mg/kg/day}$).

Although, this study did not find definitive evidence of liver damage, other studies have shown that the liver is a target organ. Katahira (1982) cites that other studies have reported liver damage in cats and rats following inhalation, intravenous, or intramedullary injection (Lehmann and Flury, 1943; Okhumra, 1958; Jochmann, 1961).

Liver effects (centrilobular cytomegaly) were observed in mice exposed to 5000 ppm THF 6 hr/day, 5 day/week for 13 weeks. Liver effects were not observed in rats in this study; however, acanthosis and supportive inflammation of the forestomach was observed in rats exposed to 5000 ppm (Grumbien, 1988)

Critical Studies:

Katahira, T. 1982. [Experimental studies on the toxicity of tetrahydrofuran]. Osaka Shiritsu Daigaku Igaku Zasshi 31;221-239. (Japanese)

Grumbein, S. 1988. 13-Week subchronic toxicity test by inhalation of tetrahydrofuran in Fisher 344 rats and B6C3F1 mice. Pathology Working Group Chairperson's Report. Submitted to National Toxicology Program, Research Triangle Park, NC.

Please note that the number derived is an interim number and ECAO is seeking further review of this assessment. We will forward any additional information to you as soon as it is available. Should you desire any additional information, do not hesitate to call me at FTS 684-7300

cc: C. DeRosa (ECAO-Cin)
S. Levinson (Region I)
B. Means (OS-230)
T. O'Bryan (OS-230)
S. Sokol (Balson Environmental Consulting)

U.S. ENVIRONMENTAL PROTECTION AGENCY
J.F.K. FEDERAL BUILDING
BOSTON, MA 02203

Date: December 21, 1990

Subj: Mottolo Site Feasibility Study

From: Maureen R. McClelland, Environmental Scientist
Ground Water Management and Water Supply Branch

To: Roger Duwart, R.P.M.
New Hampshire

I have reviewed the Mottolo Site Feasibility Study and have the following comments for clarification/revision.

- I. In regards to setting a TCL for tetrahydrofuran: The US EPA approach to analyzing systemic toxicity data follow general format set forth by NRC in its description of the risk assessment process. The determination of the presence of risk and potential magnitude is made during the risk assessment process which consists of hazard identification, dose response assessment and risk characterization.

In general the Rfd is an estimate with uncertainty spanning perhaps an order of magnitude of a daily exposure to the human population including sensitive subgroups that are likely to be without an appreciable risk of deleterious effects during a lifetime.

Having been appraised by the risk assessor that a potential risk exists, the risk manager considers control options available under existing statutes and other relevant non risk factors (e.g. benefits to be gained and costs to be incurred). All of these considerations go into the determination of a TCL.

Therefore, use of a conservative, oral Rfd of 2.0×10^{-2} mg/kg/day calculated with an uncertainty factor of 1,000 (adjusted one order of magnitude) results in a action level of 0.77 mg/l for THF, a level considered to be protective of public health.

- II. pg.2-12 ...within the EPA acceptable hazard index range of 1 to 10.

Comments: The EPA does not use a range of 1 to 10 for the hazard index. EPA policy is a hazard index less than or equal to one is acceptable.

APPENDIX D



ROBERT W. VARNEY
COMMISSIONER

PHILIP J. O'BRIEN, Ph.D.
DIRECTOR

MICHAEL A. SILLS, Ph.D., P.E.
CHIEF ENGINEER

State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
WASTE MANAGEMENT DIVISION

6 Hazen Drive, Concord, NH 03301-6509
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WASTE MANAGEMENT COUNCIL

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JOHN LAMALLEY
JOHN LECRAW
FREDERICK MCGARRY
JOHN OSGOOD
LOKRAINE SANDER
GAIL THERRIAULT

September 9, 1991

Julie Belaga
Regional Administrator
USEPA, Region I
JFK Federal Building
Boston, MA 02203

Re: Record of Decision
Dover Landfill Site
Dover, New Hampshire

Dear Administrator Belaga:

The New Hampshire Department of Environmental Services (DES) acting as agent for the State of New Hampshire has reviewed the above referenced draft Record of Decision and offers the following comments:

Source Control:

DES concurs with the source control measures selected by EPA including capping, installation of an upgradient groundwater diversion trench and the construction of a source leachate extraction and treatment system. These elements are consistent with DES policy.

Cap:

DES concurs with EPA's selection of a double impermeable layer cap in this instance. Such a cap reflects state of the art engineering practice required to insure cap integrity and longevity both of which are of critical importance due to (a) the presence of relatively high concentrations of hazardous contaminants; (b) the proximity of potential receptors; and, (c) the critical assumption of cap integrity as it relates to the proposed control of migration methods to be commented upon below.

Eastern Contaminant Plume Management:

DES concurs with EPA's decision to allow for natural attenuation of the eastern plume which is migrating toward the Cocheco River. This remedy affords protection of the Cocheco in that New Hampshire surface water quality standards will be met.

Julie Belaga, Regional Administrator, USEPA, Region I
ROD-Dover Landfill
September 9, 1991
Page No. 2



Southern Contaminant Plume Management:

DES is reserving its concurrence on that portion of the remedy which addresses the southern plume until the pre-design studies as described on page 60 of the ROD are completed.

Sincerely, /

Philip J. O'Brien (Ph.D.)
Director
Waste Management Division

Robert W. Varney
Commissioner
Department of Environmental Services

PJO/kk1/WPP#151

cc: Carl W. Baxter, P.E., NHDES-WMEB
Richard H. Pease, P.E., NHDES-WMEB
Paul Currier, P.E., NHDES-WSPCD
Jeffrey A. Meyers, Esq., NHDOJ-AGO
Daniel Coughlin, P.E., USEPA, Region I
Cheryl Sprague, USEPA, Region I

APPENDIX E

ACTION-SPECIFIC ARARs

<u>Requirement</u>	<u>Status</u>	<u>Requirement Synopsis</u>	<u>Action to be Taken to Attain Requirement</u>
STATE - NH Admin. Code ENV-Ws 403 Wastewater Discharge Permits	Relevant and Appropriate	Establishes effluent monitoring system for all industrial wastewater discharges to surface waters and sets general standards for maintaining water quality.	While no permits will be required under these regulations, discharge of water from the treatment systems will meet the general substantive standards of this regulation. In addition, all discharges will be monitored in accordance with this regulation.
STATE - NH Admin. Code ENV-A Part 1002 Fugitive Dust Control	Applicable	Requires precautions to prevent, abate and control fugitive dust during specified activities, including excavation, construction and bulk hauling.	Mitigative measures will be taken to control fugitive dust released during recontouring and other remedial activities.
STATE - NH Admin. Code ENV-A Part 1204 Control of VOC Emissions	Relevant and Appropriate	Specifies VOC emission control methods and establishes limitations on VOC emissions for various industries.	Any air emissions from the capped Landfill or the TSD facility will be controlled in accordance with current requirements. No emissions of VOC's above current state standards will be allowed.

ACTION-SPECIFIC ARARs

<u>Requirement</u>	<u>Status</u>	<u>Requirement Synopsis</u>	<u>Action to be Taken to Attain Requirement</u>
STATE - NH Admin. Code Saf-C-600 NH Department of Safety Rules for Transport of Hazardous Materials	Applicable	Identifies procedures for properly identifying, handling and shipping hazardous materials, identifies notification and manifesting procedures which must be followed.	Any on-site hazardous waste which must be shipped off-site will be packaged, labelled and shipped in accordance with this requirement.
STATE - NH Admin. Code ENV - Ws 410.05 Groundwater Protection	TBC	Prohibits discharge of hazardous waste to groundwater, or any discharge to groundwater that would result in a violation of surface water quality in adjacent surface waters. Also, groundwater cannot be altered so as to make it unsuitable for drinking.	State groundwater protection standards will be attained at and beyond the point of compliance at the completion of the remedy. In addition, any treatment system which discharges into surface waters and any activities conducted in the wetlands will be consistent with the maintenance or improvement of groundwater quality at and beyond the point of compliance. All remedial activities affecting the groundwater and surface water will be conducted so as to protect the Class A waters of the Bellamy Reservoir.
STATE - RSA 485-A:12 and NH Admin. Code ENV-Ws Parts 430-437 Surface Water Classification	Applicable	Prohibits the disposal of wastes in any manner that would lower the quality of surface water below the minimum requirements of its surface water classification.	Discharges into the Cochecho River and wetlands from the treatment systems will meet the most stringent criteria associated with the classification of these water bodies. In addition, all remedial activities will be consistent with protecting the Class A waters of the Bellamy Reservoir.
STATE - RSA 495-A:17 and NH Admin. Code ENV-Ws 415 Terrain Alteration	Applicable	Establishes criteria for any activity that significantly alters the terrain.	Criteria identified in this regulation will be addressed during recontouring and capping of the Landfill and during any on-site construction and/or remediation activities. Mitigative measures will be employed to minimize impacts to the wetlands. Once all construction activities have been completed all impacted wetlands will be restored to their original state or an area of equal dimensions will be created on adjacent land.

ACTION-SPECIFIC ARARs

<u>Requirement</u>	<u>Status</u>	<u>Requirement Synopsis</u>	<u>Action to be Taken to Attain Requirement</u>
STATE - RSA 485-A:5 WS Part 904 Standards for Pretreatment of Wastes Discharged to Publically Owned Treatment Works (POTW)	Applicable	Sets general pretreatment standards for discharge to a POTW.	Any discharges to the POTW from treatment facilities will comply with these general pretreatment standards as well as any local POTW pretreatment standards.
STATE - NH Admin. Code Chapter ENV-A 800 Testing and Monitoring Procedures	Applicable	Identifies procedures which must be followed for the testing of air emissions from stationary sources.	If the on-site TSD facility emits air contaminants, appropriate testing will be conducted to determine the levels of these contaminants.
STATE - NH Admin. Code Chapter ENV-A 900 Owner or Operator Obligations	Applicable	Owners or operators of sources which discharge air pollutants in measurable levels must retain records of the operation of the source feed stock input to the source and all available emission data. Section 902 of the regulation identifies instances (temporary failure of air pollution equipment) when the owner or operator of an air pollutant discharge source may be allowed to temporarily exceed the air discharge limits established by the State Air Board. Section 903 of the regulation requires that the owner or operator of a source which has had a compliance schedule established for their source (schedule set by State Air Board to bring air discharges from source in line with permit requirements), must comply with the schedule.	Provided that data indicates that pollutants may be readily calculated or estimated, records of air discharges from the various on-site sources will be collected and maintained in accordance with this regulation. Air pollution control device process upsets will be recorded in accordance with the appropriate requirements.

ACTION-SPECIFIC PARAGRAPHS

Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
STATE - He-P Ch. 1905.08(d)(6) a, b Monitoring of Hazardous Waste Treatment Facilities	Relevant and Appropriate	Requirements for installation and operation of one or more of the following monitoring systems: • Groundwater monitoring network. • Air emission monitoring network. • Leachate monitoring network.	Periodic monitoring of groundwater and surface water will be required in order to determine changes in site conditions and the migration of the contaminant plume. Air monitoring for workers' health and safety will be conducted during these periodic monitoring rounds.
STATE - He-P Ch. 1905.08(f) (2)(a) Additional Technical Standards - Treatment Standards	Relevant and Appropriate	General requirements for selection of treatment methods. Treatment method must accomplish one or more of the following objectives: • Render the waste non-hazardous; • Render the waste safe for handling and transport; • Make the waste amenable for recovery or reuse; • Render the waste more amenable to long-term storage or; • Reduce the volume of the hazardous waste.	These state hazardous waste treatment standards will govern the selection of the treatment technology to be determined during remedial design; that technology will comply with one or more of these standards.
STATE - He-P Ch. 1905.08 (i)(2)(c) Storage Standards	Applicable	Establishes requirements to ensure that handling and storage minimize danger to human health and the environment.	Any on-site storage of hazardous waste will be temporary in nature and will comply with all federal and state standards. Waste not treated on-site will be shipped to an off-site RCRA-approved TSD facility.

ACTION-SPECIFIC ARARs

Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
Standards for Owners and Operators of Hazardous Waste Facilities (Cont'd)	Relevant and Appropriate	<ul style="list-style-type: none"> • Procedures to be followed for conducting analysis of waste to be handled or treated at the site. • Procedures for waste handling, storage, and inspection. • General closure requirements. • Environmental and health standards to be met for facility workers. • Contingency plan to address possible accidents or releases of contaminants from the site. • Groundwater monitoring requirements to be followed during active portion and closure period of facility or site. • Necessary response actions to be taken in the event of a spill. - Public notification plan. - Technical standards for waste treatment facilities. - Requirements for surface impoundments. - Requirements for waste piles. <p>The requirements in Federal regulations 40 CFR Parts 264 and 265 are incorporated by reference.</p>	<p>NHDES should be consulted prior to the transfer of ownership of the site. In addition, all future owners must be made aware of the wastes which remain at the site and any restrictions necessary to preserve the integrity of the contained waste.</p>
STATE - He-P Ch. 190:5.08(d)(5) Transfer of Ownership or Relinquishment of Property Rights		<p>Requires approval of State prior to transfer of any ownership or operation permit for a hazardous waste facility. Owner or operator must also ensure that all future property owners are aware of former uses of site and any associated problems.</p>	

ACTION-SPECIFIC ARARs

Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
STATE - He-P Ch. 1905 New Hampshire Hazardous Waste Rules	Relevant and Appropriate	General requirements for treatment, storage and disposal of hazardous waste and closure of hazardous waste facilities.	Site activities will meet the substantive standards set out in these regulations.
STATE - He-P Ch. 1905.04 Manifesting Requirements	Applicable	General requirements for manifesting and documenting all off-site shipments of hazardous materials.	Any off-site shipment of hazardous waste will be manifested in accordance with these requirements.
STATE - He-P Ch. 1905.05 Packaging and Labelling Requirements	Applicable	Identifies requirements for packaging and labelling of all hazardous materials to be shipped off-site.	Any hazardous waste shipped off-site will be packaged and labelled in accordance with these regulations.
STATE - He-P Ch. 1905.06 Standards for Generators	Relevant and Appropriate	General definitions and requirements for generators of hazardous wastes. Outlines procedures to determine whether a person is a generator. Defines requirements for obtaining a generator's ID number and record-keeping procedures which must be followed.	These standards are relevant to all 'hot spot' wastes uncovered during recontouring and all sludges and filters generated by the treatment facilities. The substantive requirements of this regulation will be followed in handling, identifying, transporting and disposing of these wastes.
STATE - He-P Ch. 1905.08 Standards for Owners and Operators of Hazardous Waste Facilities	Relevant and Appropriate	General requirements for owners or operators of hazardous waste site or treatment facilities. Requirements include: <ul style="list-style-type: none"> • Security measures to minimize access to the facility or site. • Training requirements for employees at the site. • Design standards for hazardous waste treatment facilities. 	All remedial activities will comply with the substantive provisions of state hazardous waste regulations. If any state standards under this regulation are more stringent than RCRA standards, then the more stringent state standard will control. Since this regulation addresses and incorporates by reference many of the RCRA hazardous waste regulations, see the actions to be taken for specific RCRA regulations listed above.

ACTION-SPECIFIC ARARs

<u>Requirement</u>	<u>Status</u>	<u>Requirement Synopsis</u>	<u>Action to be Taken to Attain Requirement</u>
FEDERAL - DOT 49 CFR Part 107 49 CFR Parts 171-179 Department of Transportation Regulation for Transport of Hazardous Materials	Applicable	Requirements for handling labelling, manifesting and transporting hazardous waste.	Hazardous wastes generated from the on-site TSD facility or from "hot spots" encountered during the Landfill recontouring will be shipped off-site. These off-site shipments will comply with handling, labelling, packaging, and transport requirements covered by this regulation.
FEDERAL - EPA Guidance Manual on the Development and Implementation of Local Discharge Limitations Under the Pretreatment Program (December, 1987)	To be Considered	Provides technical guidance on the development of local limits. EPA's General Pretreatment Regulations require the establishment of local limits for POTWs with federally approved pretreatment programs.	Discharges to the local POTW will meet the applicable limits imposed on discharges to the sewer system.
FEDERAL - Permit Applicants Guidance Manual for the General Facility Standards of 40 CFR 264 (SW-968, October 1983)	To be Considered	Guidelines for determining the necessary requirements and standards which a proposed RCRA facility must meet prior to the facility obtain- ing an operating permit.	The substantive requirements identi- fied in this guidance, as necessary to obtain a permit, will be addressed by this alternative but a permit need not be obtained prior to construction and operation of this facility.
FEDERAL - Guidance Manual for POTW Pretreatment Program Development (Oct. 1983)	To be Considered	Provides information necessary for local POTWs to develop approved pre-treatment program. The manual delineates what data and information must be submitted to EPA in order to obtain regulatory approval of the program.	Guidance will be used to evaluate whether site-generated waste water is compatible with the local POTW. Discharges to Dover POTW will meet applicable pre-treatment requirements.

ACTION-SPECIFIC ARARs

<u>Requirement</u>	<u>Status</u>	<u>Requirement Synopsis</u>	<u>Action to be Taken to Attain Requirement</u>
FEDERAL - CWA 40 CFR Part 122, 124, 125 National Pollutant Discharge Elimination System	Relevant and Appropriate	NPDES is the national program for issuing, monitoring, and enforcing permits for direct discharges into waters of the United States.	Discharges from the treatment systems, except in the case of discharges to the Dover POTW, are considered on-site discharges for the purpose of these regulations. No NPDES permit will be required for discharges to the Cocheco River and to the surrounding wetlands. However, all substantive requirements of the NPDES program must be met including the effluent standards (whether water quality based or technology based), the monitoring & testing requirements, and standard and special conditions for discharge. Discharges from the treatment system to the Dover POTW are considered off-site activities for purposes of this and other regulations. Therefore both the substantive and administrative provisions of this regulation must be met if discharge to the POTW is chosen during the remedial design.
FEDERAL - CWA 40 CFR Part 403 EPA Pretreatment Standards	Relevant and Appropriate	General guidelines to be followed in establishing pretreatment effluent discharge limits for pollutants which will be discharged to a publicly owned treatment works.	Discharges from the treatment system to the Dover POTW are considered off-site activities for purposes of this and other regulations. Therefore both the substantive and administrative provisions of this regulation must be met if discharge to the POTW is chosen during the remedial design.

ACTION-SPECIFIC ARARs

Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
FEDERAL : RCRA 40 CFR Part 268 Land Disposal Restrictions	Relevant and Appropriate	Identifies hazardous waste types and specific EPA hazardous waste codes which must meet specified standards prior to placement or disposal of the waste in a land unit. Land Ban also specifies treatment processes to be used to meet goals.	This requirement is relevant and appropriate only to the extent that Land Ban hazardous materials are discovered on-site and moved outside the area of contamination. Any "hot spot" uncovered during recontouring of the landfill would have to be sent to an off-site RCRA TSD Facility. If the waste falls within one of the regulated waste codes under the Land Ban, then treatment of the waste to a point where the waste may be disposed of in an off-site RCRA land disposal unit, would be necessary. Any hazardous sludges or wastes generated during the treatment of contaminated groundwater will be tested to determine that all requirements established under the land ban regulation are complied with prior to any off-site disposal in a RCRA approved land disposal unit.
FEDERAL - RCRA - 40 CFR 264.170 - 178 (Subpart I) Use and Management of Containers	Relevant and Appropriate	Identifies requirements for the use and management of containers holding hazardous substances.	Any containers holding liquids which are uncovered by recontouring will meet the requirements of this regulation. In addition any containers used to store treatment sludges, "hot spot" waste, or treatment filters will meet the standards of this regulation.
FEDERAL - RCRA - 40 CFR 264.1030 - 1036 and 264.1050 - 1064 (Subparts AA and BB) Standards for Air Emissions for Process Vents and Equipment Leaks	Relevant and Appropriate	These two subparts set standards for air emissions from treatment systems.	The design and maintenance of all components of the treatment systems will comply with the standards set out in these regulations
FEDERAL CAA - National Ambient Air Quality Standards 40 CFR Part 50	Applicable	Maximum primary and secondary 24-hour concentrations for particulate matter.	Mitigative measures to reduce generation of dust or particulate matter will be employed during all site activities.
FEDERAL - CAA..... NESHAP 40 CFR 61, S	Relevant and Appropriate	Sets National Emission Standards for Vinyl Chloride	Any on-site treatment processes such as air strippers must meet the relevant standard.

ACTION-SPECIFIC ARARs

Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
FEDERAL - RCRA 40 CFR Part 264.70 - 264.77 (Subpart E) Manifest System, Recordkeeping and Reporting	Relevant and Appropriate	Regulations apply to owners and operators of both on-site and off-site facilities. Requirement identifies procedures to be followed in filling out, filing and submitting hazardous waste manifests for all shipments of hazardous waste sent from and received by a facility.	All hazardous materials generated by the treatment systems or 'hot spots' uncovered by recontouring, must be evaluated, manifested, packaged, labeled and recorded in accordance with these regulations prior to shipment off-site.
FEDERAL - RCRA 40 CFR Part 264.10-264.18 (Subpart B) General Facility Standards	Relevant and Appropriate	This subpart applies to all owners and operators of hazardous waste facilities. The subpart identifies procedures which must be followed for the operation and maintenance of a hazardous waste TSD facility. General areas covered under this subpart are: <ul style="list-style-type: none"> • Security requirements for TSD facilities. • General facility inspection requirements. • Personnel training requirements. • Procedures to prevent mixing of incompatible wastes. • Siting requirements for a TSD facility. 	Only those portions of this subpart addressing security, inspection, personnel training, and precautions for handling incompatible wastes are relevant and appropriate to this remedy. All site operations, including the construction and operation of the treatment facilities will comply with the substantive requirements of these portions of this subpart.
FEDERAL - RCRA 40 CFR Part 264.30-37 (Subpart C) Preparedness and Prevention	Relevant and Appropriate	Identifies requirements which must be met during design, construction, and operation of TSD facilities to minimize possibility of fires, explosions or unplanned releases of waste.	All site operations, including the construction and operation of the treatment facilities, will be undertaken only after the substantive provisions of the preparedness and prevention regulations are in place.
FEDERAL - RCRA 40 CFR Part 264.50-264.56 (Subpart D) Contingency Plan and Emergency Procedures	Relevant and Appropriate	Identifies the requirements which must be addressed in a contingency plan. Each TSD facility must have a contingency plan which identifies all procedures to be followed in the event of fire, explosion or a planned release from a facility.	A contingency plan will be developed and implemented for the operation of the treatment facilities, for any recontouring activities, and for all other remedial activities. All on-site activities will comply with all emergency plans and procedures.

ACTION-SPECIFIC ARARs

Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
FEDERAL - RCRA 40 CFR Sections 264.190 - 198 (Subpart J) Requirements for the design, installation and operation of any tanks or tank systems which are used to store or treat hazardous liquids or sludges.	Relevant and Appropriate	Regulates tanks or tank systems which are to be used to temporarily store hazardous liquids or as part of a treatment system for hazardous liquids or sludges must be designed, installed and operated in accordance with the RCRA Standards.	Tanks or tank systems used to temporarily store hazardous materials that have been generated by site treatment systems or uncovered as 'hot spots' during recontouring, will meet all substantive requirements of these regulations.
FEDERAL - RCRA 40 CFR Sections 264.220 - 264.230 (Subpart K) Design, operation and closure of surface impoundments.	Relevant and Appropriate	General requirements for surface impoundments. Requirements include design standards, operational requirements, monitoring and record keeping requirements and closure requirements.	If surface impoundments are used to temporarily store 'hot spot' materials, treatment sludges, or treatment filters, then these impoundments will comply with all substantive provisions of these regulations. Those surface impoundment regulations relating to closure and post-closure care are also relevant and appropriate to the cap design and leachate treatment portions of this remedy.
FEDERAL - RCRA 40 CFR Sections 264.250 - 264.259 (Subpart L) Design and operation procedures for waste piles which are used to temporarily store hazardous soils or sludges.	Relevant and Appropriate	General design and operation requirements for temporary storage of hazardous soils and/or sludges. Locations must have an impermeable liner and materials stored in piles must be free of standing liquid.	If waste piles are used to temporarily store 'hot spot' materials, treatment sludges, or treatment filters, then these piles will comply with all substantive provisions of these regulations.
FEDERAL - RCRA 40 CFR Part 262 (Subpart E) Standards Applicable to Generators of Hazardous Waste	Relevant and Appropriate	Establishes requirements applicable to generation of hazardous wastes.	All hazardous materials generated by the treatment systems or 'hot spots' uncovered by recontouring, must be tested, manifested, packaged, labeled and recorded in accordance with these regulations prior to shipment off-site.
FEDERAL - RCRA 40 CFR Part 263.10 - 263.22 (Subparts A and B) Standards Applicable to Transporters of Hazardous Waste	Relevant and Appropriate	Identifies manifesting procedures to be followed for all shipments of hazardous waste.	Off-site shipments of hazardous waste or materials will be properly manifested and logged. Transporters will comply with these regulations.

ACTION-SPECIFIC ARARs

Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
FEDERAL - RCRA 40 CFR Sections 264.90-264.101 (Subpart F) Releases from Solid Waste Management Units. Identifies procedures to be followed to ensure that groundwater standards are met.	Relevant and Appropriate	General facility requirements for groundwater monitoring at affected facilities and general requirements for corrective action programs if required at regulated facilities.	A comprehensive groundwater monitoring system, designed to detect and measure groundwater contamination at and beyond the point of compliance, will meet the substantive standards of this regulation.
FEDERAL - RCRA 40 CFR Sections 264.110 - 264.120, (Subpart G) Closure and Post Closure Requirements for closure/post closure of a landfill. Groundwater monitoring and reporting requirements for a period of 30 years from the date of closure.	Relevant and Appropriate	Sets general standards for closing landfills. Requires owners/operators of landfills to develop closure and post-closure plans. In addition, the regulations set forth post-closure requirements such as groundwater monitoring for a period of 30 years after closure.	<p>Implementation of this alternative would comply with the requirements of this alternative in the following manners:</p> <ul style="list-style-type: none"> • Design of the cap will minimize the need for future maintenance. • Capping the Landfill would minimize to the extent necessary to protect human health and environment from physical exposure to the wastes on-site and continued fugitive air emissions from the Landfill. Also, construction of the cap would minimize future on-site maintenance. • Collection and treatment of the contaminated groundwater from within and around the perimeter of the Landfill would minimize to the extent necessary the risk to human health and the environment from contaminated groundwater currently migrating off-site. <p>Monitoring of the off-site groundwater will be conducted in accordance with this regulation</p>

LOCATION-SPECIFIC ARARs

<u>Media</u>	<u>Requirement</u>	<u>Status</u>	<u>Requirement Synopsis</u>	<u>Action to be Taken to Attain Requirement</u>
Wetlands/ Floodplains/ Rivers/ Reservoirs	State - RSA 482-A NH Admin. Code ENV - Wt 300 New Hampshire Criteria and Conditions for Fill and Dredging in Wetlands	Applicable	Sets general standards and criteria for filling, dredging and construction in or near wetlands.	Any remedial activities affecting the wetlands will meet the substantive requirements of this state statute and its related regulations.
Wetlands/ Floodplains/ Rivers/ Reservoirs	State - ENV-Ws Part 415, RSA 485:A-17 NH Rules Relative to Prevention of Pollution from Dredging, Filling, Mining, Transporting, Construction	Relevant and Appropriate	Controls activities which involve dredging in or around surface water bodies.	Any dredging or filling activities affecting the Bellamy Reservoir or the Cochecho River, including the dredging of the sediments in the swale, must meet the substantive requirements of this regulation.
Groundwater	State - Wellhead Protection Program	To be Considered	Sets general criteria for wellhead protection area delineation and identification of contamination sources to be excluded from protection areas.	State Plan will be considered to protect the Calderwood well.

LOCATION-SPECIFIC ARARs

<u>Media</u>	<u>Requirement</u>	<u>Status</u>	<u>Requirement Synopsis</u>	<u>Action to be Taken to Attain Requirement</u>
Wetlands/ Floodplains/ Rivers/ Reservoirs	Federal - 16 USC 661 et. seq., Fish and Wildlife Coordination Act	Applicable	Requires actions to be taken to avoid adverse effects, minimize potential harm to fish, or wildlife and to preserve natural and beneficial uses of the land.	Discharges from the treatment system(s) will be conducted in such a manner as to minimize adverse impacts on fish and wildlife. Federal and state agencies listed in this statute should be consulted during remedial design if any adverse impacts are anticipated.
Groundwater	Federal - Groundwater Protection Strategy	To be Considered	EPA's groundwater protection strategy [as identified in <u>Groundwater Protection Strategy</u> . EPA Office of Groundwater Protection, August, 1984], includes the following components: state. <ul style="list-style-type: none"> Assessing the problems that may exist from unaddressed sources of contamination-in particular, leaking storage tanks, surface impoundments, and landfills; Issuing guidelines for EPA decisions affecting groundwater protection and cleanup; and strengthening EPA's organization for groundwater management at the headquarters and regional levels, and strengthening EPA's cooperation with Federal and State agencies. 	Groundwater at and beyond the point of compliance will be restored to its beneficial use by the remedy through a combination of capping, leachate collection and treatment, natural attenuation in the eastern plume and the collection and treatment of contaminated groundwater in the southern plume.
Groundwater	Federal - Groundwater Classification Guidelines	To be Considered	Classifies groundwater by its potential beneficial uses such as special groundwater (Class 1) which are groundwaters that are "highly vulnerable to contamination because of the hydrological characteristics of the areas in which it occurs, and characterized by either of the following factors: <ul style="list-style-type: none"> The groundwater is irreplaceable; no reasonable alternative source of drinking water is available to substantial populations. The groundwater is ecologically vital; the aquifer provides the base flow for a particularly sensitive ecological system that, if polluted, would destroy a unique habitat." 	These guidelines will be consulted in evaluating the success of the remedy and the speed with which groundwater is cleaned up.

LOCATION-SPECIFIC ARARs

Media	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
Wetlands/ Floodplains/ Rivers/ Reservoirs	Federal - Clean Water Act (CWA) Section 404; 40 CFR Part 230.33 CFR Parts 320-330	Applicable	Requirements under these codes prohibit the discharge of dredged or fill material into water bodies or wetlands without complying with the procedures identified under the permitting requirements for this code.	The substantive wetland dredge and fill requirements of the CWA will be met in all activities in and around the wetlands. No fill material from the recontouring of the Landfill from the construction of the Interceptor trench/extraction well system, or from the construction of the leachate treatment plant will be placed in the wetlands surrounding the site. In addition, construction and maintenance of the off-site groundwater treatment system/extraction wells will be conducted to have the most limited impact on the wetland. All material dug from the wetlands will be tested to determine whether it contains RCRA wastes; if so, that material will be disposed in accordance with RCRA requirements including the land ban regulations. That clean fill which is not redeposited in the excavation will not be deposited in the wetlands. Wetlands will be restored to their natural state at the completion of the remedy, to the extent technically practicable. Neither the procedures or permitting requirements of this statute need to be met.
Wetlands/ Floodplains/ Rivers/ Reservoirs	Federal Executive Orders 11988 & 11990 Floodplain Management and Protection of Wetlands Federal - 40 CFR Part 6 Appendix A	Applicable	Federal agencies are required to preserve and enhance the natural and beneficial values of wetlands and floodplains.	Measures to mitigate damage to the wetlands will be employed at all times during the construction and operation of the remedy. After the construction of the management of migration element of the remedy, measures will be undertaken to restore the wetlands.
Wetlands/ Floodplains/ Rivers/ Reservoirs	Federal - General Facility Standards 40 CFR 264.18(a) - Seismic Standards	Relevant and Appropriate	New treatment, storage or disposal of hazardous waste prohibited within 200 feet of a fault which has had a displacement in Holocene time.	Any groundwater/leachate treatment facility will be located in accordance with this requirement.
Wetlands/ Floodplains/ Rivers/ Reservoirs	Federal - General Facility Standards 40 CFR 264.18(b)	Relevant and Appropriate	Facility where RCRA hazardous waste will be treated, stored or disposed of that lies within a 100 year floodplain must be designed, constructed, operated and maintained to prevent the washout of any hazardous waste in the event of a 100 year flood.	Any groundwater/leachate treatment facility, if located in a floodplain, will be designed and constructed in accordance with these regulations.

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CHEMICAL-SPECIFICARARs, CRITERIA, ADVISORIES AND GUIDANCEMEDIA: AIR

<u>Pollutant</u>	<u>National Ambient Air Quality Standards (40 CFR 50)(ug/m³)/(ppm)</u>	<u>Ambient Air Standards (NII Admin Code - Chpt 300 - Part 303)(ug/m³)</u>	<u>Toxic Air Contaminant Levels (NII Admin. Code ENV-A-1300 (ug/m³))</u>
Carbon Monoxide (CO)	40000 (1-hour average)/35 (1 hour average) 10000 (8-hour average)/9 (8 hour average)	40000 (1 hour average) 10000 (8 hour average) ^b	
Lead (Pb)	1.5 (3 months)	1.5 (annual)	
Nitrogen Dioxide (NO ₂)	100 (annual)/0.05 (annual)	100 (annual)	
Ozone (O ₃)	235 (1-hour)/0.12 (1 hour)	235 (1 hour)	
Particulate Matter (PM-10)	150 (24-hour)/ NA 50 (annual)/ NA	150 (24 hour) ^a 50 (annual)	
Sulfur Dioxide (SO ₂)	1300 (3-hour)/0.5 (3 hour) 365 (24-hour)/0.14 (24 hour) 80 (annual)/0.036 (annual)	1300 (3 hour) 365 (24 hour) 80 (annual)	
Hydrocarbon (HC)		160 (3 hour)	
Acetone			17800
Arsenic			0.48
Barium			1.7
Benzene			71
Beryllium			0.0048
Cadmium			0.024
Chromium			0.12
Cobalt			0.167
Copper			0.33
Dichloromethane			417
Hydrogen Sulfide			46.7
Methyl ethyl ketone			1967
Methyl isobutyl ketone			2050
Toluene			1500
1,1,1 Trichloroethane			6333
Trichloroethylene			643
Tetrachloroethylene			810
Xylene			1450
Vinyl Chloride			24
Zinc			50

^a This maximum 24-hr level may not be exceeded more than once per year.
^b This maximum 8-hr level may not be exceeded more than once per year.
NA Not Applicable.

CHEMICAL-SPECIFIC

ARAR: CRITERIA, ADVISORIES AND GUIDANCE

MEDIA: SURFACE WATER
CLEAN WATER ACT (CWA) - WATER QUALITY CRITERIA

Chemical Potential Chemicals of Concern	For Protection of Human Health		For Protection of Aquatic Life
	Water and Fish Ingestion (ug/l)	Fish Consumption Only (ug/l)	Freshwater Acute/ Chronic (ug/l)
<u>Volatile Organic Compounds</u>			
Acetone	-	-	5,300/-(b)
Benzene	0.66	40	-
Chloroethane	-	-	-
Dichloroethylene	0.033	-	11,600/-(b)
1,1-Dichloroethylene	3100	1.85	11,800/20,000/-(b)
1,2-Dichloroethane	0.94	243	32,000/-(b)
Ethylbenzene	1400	3,250	-
Methylene Chloride	-	-	-
Methyl Ethyl Ketone	-	-	-
Methyl Isobutyl Ketone	-	-	5,280/840(b)
Tetrachloroethylene	0.80	8.85	17,500/-(b)
Toluene	14000	424,000	45,000/21,900
Trichloroethylene	2.7	80.7	-
1,1,1-Trichloroethane	18000	1,030,000	-
Tetrahydrofuran	-	-	-
Vinyl Chloride	2	2	-
<u>Acid & Base/Neutral Extractable Organics</u>			
Anthracene	-	-	-
Benzo(a)anthracene	-	-	-
Benzo(a)fluoranthracene	-	-	-
Benzo(a)pyrene	-	-	-
Bis(2-ethylhexyl) phthalate	-	-	-
Chrysene	-	-	-
Di(ethylhexyl)phthalate	-	-	-
Diethylphthalate	-	-	-
Fluoranthene	350000	3,980/-(b)	-
Fluorene	42	-	-
Phenanthrene	-	-	-
Pyrene	-	-	-
<u>Metals</u>			
Antimony	150	-	850/48(b)(c)(e)
Arsenic	0.0022	-	-
Beryllium	0.0068	-	0.64/10.32(f)
Cadmium	10	-	1,700/210(g)
Chromium	170(g)	3,433,000(b)	4/3(h)
Copper	-	-	22/5.2
Cyanide	200	5	11/41(f)
Lead	50	-	2.4/0.012
Mercury	0.14	0.146	363/40(f)
Nickel	1.3 x 10 ⁻⁷	100	-
Selenium	10	-	0.25(f)/0.12(f)(h)
Silver	50	-	-
Thallium	13	-	30/27(f)
Zinc	-	-	-

- a - Proposed MCLG or MCL (1988)(53 FR 31516).
b - Lowest Observed Effect Level (LOEL).
c - Proposed MCLGs 50 FR 46936 (November 13, 1985).
d - Value shown is for di-2-ethyl hexyl phthalate.
e - Value shown is for (pent) arsenic. (Tri) arsenic is 360/190 ppb.
f - Hardness dependable criteria (20 mg/l used). Values calculated using formulas listed in EPA Quality Criteria for Water, 1986. EPA 440/5-86-001.
g - Chromium +3.
h - Value shown corresponds to a hardness of 100 mg/l as CaCO₃. EPA Quality Criteria for Water (1986) does not present a means (formula) to calculate a new value using a hardness of 20 mg/l as CaCO₃.

CHEMICAL-SPECIFIC ARARs, CRITERIA, ADVISORIES AND GUIDANCE
MEDIA: GROUNDWATER

Chemical	Safe Drinking Water Act Maximum Contaminant Levels (MCLs)(ug/l) State NH Admin. Code WS 302 Federal 40 CFR 141	Safe Drinking Water Act Maximum Contaminant Levels Goals (MCLGs (ug/l) Federal 40 CFR 141	Resource Conservation and Recovery Act (RCRA) Maximum Contaminant Levels Federal 40 CFR 264.94 (ug/l)	DPHS - Health Based - GW Standards State WS 410.05(e)(ug/l)
Potential Chemicals of Concern				700
<u>Volatile Organic Compounds</u>				
Acetone	-	0 ^a	-	-
Benzene	5	-	-	7
Chloroethane	-	7	-	-
Dichloroethylene	-	7	-	-
1,1-Dichloroethylene	7	0	-	680
1,2-Dichloroethane	5	700	-	5
Ethylbenzene	-	5	-	170
Methylene Chloride	5	-	-	350
Methyl Ethyl Ketone	-	-	-	.68
Methyl Isobutyl Ketone	-	0(c)	-	-
Tetrachloroethylene	5	1,000(f)	-	-
Toluene	-	0	-	-
Trichloroethylene	5	200	-	154
1,1,1-Trichloroethane	200	-	-	-
Tetrahydrofuran	-	0	-	-
Vinyl Chloride	2	-	-	-
<u>Acid & Base/Neutral Extractable Organics</u>				
Anthracene	-	-	-	-
Benzo(a)anthracene	-	-	-	.003
Benzo(a)fluoranthracene	-	0	-	50,000
Benzo(a)pyrene	0.2(a)	-	-	-
Bis (2-ethylhexyl) phthalate	-	-	-	-
Chrysene	4(a)	0	-	1,800,000
Di(ethylhexyl)phthalate	-	-	-	54
Diethylphthalate	-	-	-	-
Fluoranthene	-	-	-	-
Fluorene	-	-	-	-
Phenanthrene	-	-	-	-
Pyrene	-	-	-	-
<u>Metals</u>				
Antimony	10/5(e)	3	50	-
Arsenic	50	0(c)	-	-
Beryllium	1	0	10	-
Cadmium	10	5(c)	50	50(100)(d)
Chromium	50	50	-	-
Copper	1,300(a)	1,300(a)	-	200
Cyanide	200	200	50	-
Lead	50/5(a)	20(c) (0(a))	2	-
Mercury	2	2	10	-
Nickel	100	100	50	-
Selenium	10	50	-	-
Silver	50	0.5	-	-
Thallium	2/1(e)	-	-	-
Zinc	-	-	-	-

a Proposed MCLG or MCL (1988)(53 FR 31516).

b Lowest Observed Effect Level (LOEL).

c Proposed MCLGs 50 FR 46936 (November 13, 1985).

d Value is for Chromium both in trivalent (III) and hexavalent (VI) form. Value in parentheses is for total combined Chromium III and Chromium VI.

e Alternative MCL options proposed 55 FR 30370 (July 25, 1990).

f Federal Register (January 30, 1991), Vol. 56 pg 3526

**CHEMICAL-SPECIFIC
ARARs, CRITERIA, ADVISORIES AND GUIDANCE**

<u>Media</u>	<u>Requirement</u>	<u>Status</u>	<u>Requirement Synopsis</u>	<u>Action to be Taken to Attain Requirement</u>
Sediments	Federal - NOAA Technical Memorandum NOS OMA 52	To be Considered	Reference doses for various contaminants in sediments and their potential biological effects on biota exposed to the contaminants.	All sediments in the drainage swale which contain arsenic in excess of 50 ppm will be removed from the swale and consolidated under the landfill cap. Measures will be taken to prevent contaminated sediment from washing into the Cocheco River during excavation.
Air	Federal - CAA - National Ambient Air Quality Standards (NAAQS) (40 CFR 50.1 - 50.12)	Relevant and Appropriate	NAAQS define levels of primary and secondary levels for six common air contaminants (sulfur dioxide, particulate matter, carbon monoxide, ozone, nitrogen dioxide and lead).	The Best Available Technology will be used to limit the emission of hazardous airborne substances during recontouring, excavation, groundwater treatment and any gas collection and treatment. Those chemical-specific standards set out in these regulations will be met by this technology.
Air	State - NH Admin. Code ENV-A:300 Ambient Air Quality Standards	Relevant and Appropriate	<p>Establishes primary and secondary ambient air levels for eight air contaminants:</p> <ul style="list-style-type: none"> • Particulate matter • Sulfur dioxide • Carbon monoxide • Nitrogen dioxide • Ozone • Hydrocarbons • Fluorides • Lead <p>Seven of the primary and secondary standards established under this state standard are adopted from the Federal NAAQS.</p>	The Best Available Technology will be employed to ensure that air emissions generated by remedial activities comply with the standards set out in this regulation.
Air	State - NH Admin. Code ENV-A 1300 Toxic Air Pollutants	Applicable	Establish ambient air limits for 74 chemicals. These ambient air limits (AALs) are levels at, or below, which ambient air concentrations of a respective air contaminant will not adversely affect human health.	Releases of contaminants to the air from any source on site will not exceed the respective AAL.

**CHEMICAL-SPECIFIC
ARARs, CRITERIA, ADVISORIES AND GUIDANCE**

<u>Media</u>	<u>Requirement</u>	<u>Status</u>	<u>Requirement Synopsis</u>	<u>Action to be Taken to Attain Requirement</u>
Groundwater	State - NH Revised Statutes Ch. 485 Drinking Water Standards	Relevant and Appropriate	Sets forth procedures for protection of drinking water supplies by establishing and adopting (under RSA 541-A) drinking water rules and primary drinking water standards. Statute also allows secondary drinking water rules to be adopted which are necessary to protect the public welfare. Maximum Contaminant Levels (MCLs) which are established under this statute shall be no less stringent than the most recent National Primary Drinking Water Standards which are in effect.	Groundwater at and beyond the point of compliance will attain state MCLs at the completion of the remedy. These levels will be obtained by the capture and treatment of leachate emanating from the landfill and contaminated groundwater in the southern plume. In the eastern plume, groundwater will reach MCLs through natural attenuation within 5 to 7 years.
Groundwater	State - ENV-Ws 410.05 Groundwater Protection Standards	To be Considered	Allowable limits for contaminants in groundwater are based upon New Hampshire Division of Public Health Services (health-based standards) and Federal MCLs, MCLGs and other relevant standards. Groundwater nondegradation requirements incorporate the surface water quality standards at ENV-Ws 432.	State groundwater protection standards will be attained at and beyond the point of compliance at the completion of the remedy. In addition, any treatment system which discharges into surface waters and any activities conducted in the wetlands will be consistent with the maintenance or improvement of groundwater quality at and beyond the point of compliance.
Groundwater	State - ENV-Ws-410.05(e)	To be Considered	Stipulation that groundwater shall not contain any substance in a concentration which the Water Supply and Pollution Control Commission determines is harmful to human health or the environment. Regulation states that Primary (health-based) Maximum Contaminant Levels (MCLs) will be used to regulate groundwater contaminants.	State groundwater protection standards will be attained at and beyond the point of compliance at the completion of the remedy. In addition, any treatment system which discharges into surface waters and any activities conducted in the wetlands will be consistent with the maintenance or improvement of groundwater quality at and beyond the point of compliance.
Groundwater	State - Admin. Code Part WS 315-319 Primary and Secondary Standards	Relevant and Appropriate	NH MCLs establish levels of contaminants allowable in water supplies. They are generally equivalent to SDWA MCLs.	At the completion of the remedy state MCLs will be met at and beyond the point of compliance.
Surface Water	Federal - CWA - Ambient Water Quality Criteria (AWQC) - Protection of Freshwater Aquatic Life, Human Health, Fish Consumption	Relevant and Appropriate	AWQC are developed under the Clean Water Act (CWA) as guidelines from which states develop water quality standards. A more stringent AWQC for aquatic life may be found relevant and appropriate rather than an MCL, when protection of aquatic organisms is being considered at a site.	Any treated water discharged into the Cochecho River or the wetlands surrounding the site must meet AWQCs.
Surface Water	State - RSA 485A:8 NH Admin. Code ENV-Ws Part 432 Surface Water Quality Standards	Applicable	Surface water classification standards for Class B waters, and potentially Class A waters, are applicable to the site. New Hampshire Surface Water Quality standards are essentially the same as federal ambient water quality criteria.	Discharges into the Cochecho River and wetlands from the treatment systems will meet the most stringent criteria associated with the classifications of these water bodies. In addition, all remedial activities will be consistent with protecting the Class A waters of the Bellamy Reservoir.

**CHEMICAL-SPECIFIC
ARARs, CRITERIA, ADVISORIES AND GUIDANCE**

Media	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
Groundwater	Federal - SDWA - Maximum Contaminant Levels (MCLs) (40 CFR 141.11-141.16)	Relevant and Appropriate	Standards; (abbreviated as MCLs - Maximum Contaminant Levels), which have been adopted as enforceable standards for public drinking water systems.	Groundwater at and beyond the point of compliance will attain MCLs at the completion of the remedy. These levels will be obtained by the capture and treatment of leachate emanating from the landfill and contaminated groundwater in the southern plume. In the eastern plume, groundwater will reach MCLs through natural attenuation within 5 to 7 years. Note that the SDWA MCL for arsenic in the groundwater has been determined to be relevant but not appropriate and therefore is not an ARAR. Instead, the RCRA concentration limits found at 40 CFR 264.94 will control.
Groundwater	Federal - RCRA Maximum Concentration Limits 40 CFR Part 264.94	Relevant and Appropriate	Standards; (MCLs-Maximum Concentrations Limits), for 14-toxic compounds. MCLs have been adopted as part of RCRA groundwater protection standards. These groundwater protection standards are equal to MCLs established under the National Primary Drinking Water Standards, based on 1962 Public Health Service Regulations under the Safe Drinking Water Act (SDWA).	Groundwater at and beyond the point of compliance will attain MCLs at the completion of the remedy. These levels will be obtained by the capture and treatment of leachate emanating from the landfill and contaminated groundwater in the southern plume. In the eastern plume, groundwater will reach MCLs through natural attenuation within 5 to 7 years. In addition, prior to or during remedial design, EPA and the state will determine whether background levels of arsenic in the groundwater exceed 50 ppm. If so, the cleanup standard will be set at background levels.
Groundwater	Federal - SDWA Maximum Contaminant Level Goals (40 CFR 141.50-141.51)	To be Considered	MCLGs-Non-enforceable health goals for public water systems. Maximum Contaminant Level Goals (MCLGs) are set at levels that would result in no known or anticipated adverse health effects with an adequate margin of safety.	At the completion of the remedy groundwater at and beyond the point of compliance will attain non-zero MCLGs for those substances which have no MCL. These levels will be obtained by the capture and treatment of leachate emanating from the landfill and contaminated groundwater in the southern plume. In the eastern plume, groundwater will reach these non-zero MCLGs through natural attenuation within 5 to 7 years.

APPENDIX F

STATEMENT OF FINDINGS
CONCERNING REMEDIAL ACTIVITIES
IN WETLANDS AND FLOODPLAIN

1. The remedy chosen for this Site includes excavation and construction activities in the wetlands to the south of the Site and may include limited excavation of sediments in the floodplain at the point where the drainage swale meets the Cocheco River.

Activities in the Wetlands

2. The installation of a groundwater extraction and treatment system for the management and cleanup of the Site's southern contaminant plume will require the placement of several extraction wells as well as the construction of a water transport system to convey the contaminated water to an on-site treatment facility. These activities will require that truck access through the wetlands be secured so that the wells can be drilled and the piping can be placed. In addition, these activities will require drilling and placement of wells in the wetlands and the excavation of trenches in the wetlands in which the transport pipes will be placed.

3. The remedial design of this extraction and treatment system will be guided by the principles set forth in 40 CFR Part 6, Appendix A and Executive Order 11990, as well as state wetlands law. The design will minimize the disturbance of the wetlands and its natural and beneficial uses. Mitigative measures will be taken during the construction and operation of this system so as to minimize adverse impacts on the wetlands.

4. A two phase wetland restoration plan will be undertaken, the first phase commencing at the completion of construction and the second phase commencing at the completion of the groundwater treatment. This plan will restore the wetland topography and vegetation to the extent practicable, or, if necessary, establish new wetlands of similar size in a nearby area.

5. The construction of this groundwater extraction system in the wetlands is the only practicable means for treating the contaminated groundwater in the southern plume. As documented in the ROD Decision Summary, groundwater modelling has indicated that extraction and treatment of this plume are necessary to attain ARARs at and beyond the point of compliance in a reasonable time, as well as to manage the contaminants in the short term so that they are prevented from continuing to migrate towards the Class A waters of the Bellamy Reservoir.

6. Alternative methods for contaminant cleanup in the southern plume would have a greater impact on the wetlands or would be ineffective in meeting the reasons for initiating the active

treatment of this contaminant plume. The alternative method for treating this groundwater evaluated in the Feasibility Study, the construction of an interceptor trench, would have a greater detrimental impact on the wetlands.

7. There are no alternative sites for establishing an active management of migration of the southern plume as the plume is directly under these wetlands.

8. The design, construction and operation of these remedial activities will meet state wetland protection requirements.

Activities in the Floodplain

9. If testing of the swale sediments where the swale meets the Cocheco River indicate that arsenic levels are above 50 ppm, then limited manual excavation will be undertaken to remove contaminated sediments. It is expected that this procedure will be conducted manually - without the assistance of heavy equipment - and that it will take no more than a few days.

10. This limited excavation will have minimal or no short term adverse impact on the floodplain area and it will have no long term adverse impacts.

11. The remedial activities in this area will be guided by the principles set forth in 40 CFR Part 6, Appendix A and Executive Order 11988, as well as state law protecting floodplains. Mitigative measures will be taken during the excavation of sediments in this area to protect the floodplain and its natural and beneficial uses as well as to prevent contaminants from washing into the Cocheco River.

12. No practicable alternative exists for meeting the remediation goals. As documented in the ROD Decision Summary, EPA has determined the clean-up of arsenic in the swale sediments is necessary to protect the environment. As documented in the Administrative Record and in the ROD Decision Summary, arsenic levels in sediments above 50 ppm pose a threat to the biota in the area.

13. Other clean-up/capping alternatives evaluated in the Feasibility Study are either ineffective in meeting remediation goals or will have a greater adverse impact on the floodplains while also providing less protection to the environment in the long term.

14. Since the sediments in questions are deposited in a floodplain area, the action cannot take place outside of the floodplain.

15. The remedial activities in the floodplain will comply with state floodplain protection laws.

APPENDIX G

United States
Environmental Protection Agency
Region I

RESPONSIVENESS SUMMARY
DOVER MUNICIPAL LANDFILL SITE
DOVER, NEW HAMPSHIRE

SEPTEMBER 10, 1991

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Responsiveness Summary
Dover Municipal Landfill Site

DOVER MUNICIPAL LANDFILL RESPONSIVENESS SUMMARY

PREFACE

The U.S. Environmental Protection Agency (EPA) held a 60-day comment period from March 26, 1991 to May 24, 1991 to provide an opportunity for the public to comment on the Remedial Investigation (RI), the Field Element Study (FES), the Feasibility Study (FS), the Proposed Plan and other documents developed for the Dover Landfill Superfund Site (the Site) in Dover, New Hampshire. The FS examined and evaluated various options, called remedial alternatives, to address contamination at the Site. EPA made a preliminary recommendation of its Preferred Alternative for site remediation in the Proposed Plan issued on March 15, 1991, before the start of the public comment period. All documents on which the preferred remedy was based were placed in the Administrative Record for review. The Administrative Record is a collection of all the documents considered by EPA to choose the remedy for the Site. It was made available at the EPA Records Center at 90 Canal Street in Boston, Massachusetts and at the Dover Public Library, 72 Locust Street, Dover, New Hampshire.

The purpose of this Responsiveness Summary is to document EPA responses to the questions and comments raised during the public comment period. EPA considered all of the comments in this document before selecting a final remedial alternative to address contamination at the Site.

This Responsiveness Summary is organized into the following sections:

- I. **Overview of Remedial Alternatives Considered in the Feasibility Study and Proposed Plan, including the Preferred Alternative** - This section briefly outlines the remedial alternatives evaluated in the FS and the Proposed Plan, including EPA's Preferred Alternative.
- II. **Site History and Background on Community Involvement and Concerns** - This section provides a brief Site history and a general overview of community interests and concerns regarding the Site.

Responsiveness Summary
Dover Municipal Landfill Site

III. Summary of Comments Received During the Public Comment Period and EPA Responses - This section summarizes and provides EPA's responses to the oral and written comments received from the public during the public comment period. In Part I, the comments received from citizens are presented. Part II summarizes comments received from Potentially Responsible Parties (PRPs).

IV. Remaining Concerns - This section summarizes comments raised during the public comment period that cannot be fully addressed at this stage of the Superfund process but which continue to be of concern during the design and implementation of EPA's selected remedy for the Site. EPA responds to these comments and will address these concerns during the Remedial Design and Remedial Action (RD/RA) phase of the cleanup process.

In addition, two attachments are included in this Responsiveness Summary. Attachment A provides a list of the community participation activities that EPA and the New Hampshire Department of Environmental Services (NHDES) have conducted to date at the Site. Attachment B contains a copy of the transcript from the informal public hearing held on April 16, 1991 in Dover, New Hampshire. The comments submitted by the citizens and the PRPs are available in the Administrative Record.

I. OVERVIEW OF REMEDIAL ALTERNATIVES CONSIDERED IN THE FEASIBILITY STUDY AND PROPOSED PLAN

Using information gathered during the Remedial Investigation, the Field Elements Study and the Risk Assessments (RI Risk Assessment and FES Supplemental Risk Assessment), EPA identified several cleanup objectives for the Site.

The primary cleanup objective is to reduce the risks to public health and the environment posed by exposure to the source of contamination onsite and to groundwater contamination that has already or may in the future migrate off-site. Cleanup levels for groundwater and sediments are set at levels that EPA considers to be protective of public health and the environment.

After identifying the cleanup objectives, EPA developed and evaluated potential cleanup alternatives, called remedial alternatives. The FS describes the remedial alternatives

Responsiveness Summary
Dover Municipal Landfill Site

considered to address the contaminants of concern and the media in which they pose a threat. The FS also describes the criteria EPA used to narrow the range of alternatives to 4 potential source control (SC) remedial alternatives and 4 potential management of migration (MM) remedial alternatives.

The cleanup plan selected by EPA to address Site contamination includes consolidation of the drainage ditch and drainage swale sediments and recontouring the Landfill followed by capping with a multi-layer cap and extraction and treatment of the contaminated groundwater and leachate. During remedial design, EPA will determine whether the treated contaminated groundwater will be discharged to the Cocheco River or Dover Publicly Owned Treatment Works (POTW). The selected remedy also restores contaminated groundwater at and beyond the point of compliance to cleanup levels through natural attenuation, in the eastern plume, and by active extraction and treatment of the contaminated groundwater in the southern plume. A monitoring program will be implemented during pre-design to further define the lateral extent and depth of contamination in the groundwater. In addition, the cleanup plan will rely on institutional controls to prevent any use of groundwater until contaminant concentrations have decreased to safe levels. A long-term monitoring program will also be implemented during pre-design and will continue until EPA determines that the remedy is considered protective. The estimated net present worth of the remedy is \$24.2 million.

All of the remedial alternatives considered for implementation at this Site can be found in the ROD Decision Summary, the Proposed Plan and the Feasibility Study.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

Site History

The Dover Municipal Landfill is located on a 55-acre parcel of land on Tolend Road in Dover, New Hampshire, near the Madbury and Barrington Town lines. The Bellamy Reservoir, which supplies drinking water for the towns of Portsmouth, Newcastle, Newington, Durham, Madbury, Greenland and Rye, is located 2000 feet south of the Site; and the Calderwood Well, which supplies drinking water for the City of Dover, is located approximately 2000 feet northeast of the Landfill. The Cocheco River is located approximately 500 feet east of the Landfill.

Responsiveness Summary
Dover Municipal Landfill Site

The Landfill was in use from 1960 to 1979. Wastes were disposed at the Landfill from both industrial and municipal sources. Flammable waste was reportedly dispersed across the Landfill surface and, at times, burned. A trench and cover method was used during most of the Landfill operation to dispose of the wastes. In September 1977, the New Hampshire Department of Environmental Services (NHDES) (formerly the Water Supply and Pollution Control Commission, or WSPCC) ordered landfill operators to stop accepting chemical waste for disposal. In 1980, the Town of Dover began capping procedures to close the Landfill and, in 1982, the City of Dover and NHDES closed the facility and re-excavated the firebreak ditch around the Landfill to intercept leachate.

In 1977, the Cities of Dover and Portsmouth, along with the NHDES began studying the Landfill because of its proximity to public and private water supplies. Study results indicated that ground water and surface water in the area of the Landfill contained elevated concentrations of organic and inorganic contaminants. Private drinking water wells in the vicinity of the Landfill were found to be contaminated with volatile organic compounds (VOCs). After further testing, state officials determined that the source of ground water contamination was the Dover Municipal Landfill. In 1981, an alternate water supply was provided for residents with affected wells. Residences along both Glen Hill and Tolend Roads have also tied onto this water supply line.

In 1983, the Site was evaluated by the EPA for possible inclusion on the National Priorities List (NPL). Because of the concentrations of contaminants present in sediments, surface water, and ground water, and because of the contaminants' proximity to drinking water sources, the Landfill was ranked and placed on the NPL. In 1984, the NHDES, under a cooperative agreement with EPA, initiated a Remedial Investigation (RI) of the Landfill. In 1988, a group of Potentially Responsible Parties (PRPs) signed an Administrative Order by Consent with the EPA to perform a Field Elements Study (FES), addressing data gaps of the RI, and a Feasibility Study (FS).

The RI and the FES confirmed the presence of VOCs and metals in groundwater and sediments, and VOCs in the drainage ditch surface water. A risk assessment conducted to evaluate potential risks to public health the environment revealed

Responsiveness Summary
Dover Municipal Landfill Site

increased carcinogenic and noncarcinogenic risks to human health if contaminated groundwater is consumed.

History of Community Involvement

EPA has conducted public meetings and has released fact sheets and press releases to keep the public informed of Site activities since 1984. In general, community concern about the Dover Landfill has been relatively low. However, community interest and concern increased following the release of EPA's preferred cleanup plan and the issuance of notice of potential liability for Site cleanup to the City of Dover and the Town of Madbury.

The first public meeting concerning the Dover Municipal Landfill was held on August 9, 1983. EPA and NHDES jointly discussed the findings and recommendations of the Remedial Action Master Plan (RAMP). In December 1984, EPA released a community relations plan which included a summary of the Site's history and contamination and described field activities expected to be conducted at the Site. Also in December of 1984, NHDES held a public meeting to inform the citizens about the upcoming activities of the RI/FS. After the completion of the RI/FS (March 1989), EPA and NHDES held another public meeting to discuss the results of sampling at the Site.

In March 1991, EPA and NHDES made the Administrative Record of the Site available for public review, released the Proposed Plan to the public and published a public notice and brief analysis of the Proposed Plan in Foster's Daily Democrat. The Proposed Plan was placed in the information repository at the Dover Public Library.

On March 25, 1991, EPA and NHDES held a meeting to discuss the FS results, the cleanup alternatives, and the Proposed Plan. Approximately 50 community members, including local officials and the news media attended the meeting. Questions asked or comments made at the meeting were related to the following issues: remedial costs, availability of Federal and State aid for the City of Dover, rate of plume migration, landfill cap characteristics, and PRP liability.

Public Reaction to EPA's Preferred Alternative

The concerns voiced by citizens, local officials, and PRPs at the April 16, 1991 public hearing and in the comments received by EPA relate primarily to the cost of the Preferred Alternative. Community members expressed fear